X-tra

A.T. Kearney, Inc.
699 Prince Street
P.O. Box 1405
Alexandria, Virginia 22313
703 836 6210

Management
Consultants

May 11, 1987

ATKEARNEY

Ms. Camille Connick
Regional Project Officer
U.S. Environmental Protection Agency
Room 2203
John F. Kennedy Building
Boston, Massachusetts 02203

Reference: EPA Contract No. 68-01-7038; Work Assignment No. R01-01-19; Completeness/Technical Review of Interim Status Closure Plan; Pratt & Whitney, Inc., North Haven, CT; I.D. No. CTD001449784

Dear Ms. Connick:

Enclosed please find the completeness/technical review of the closure plan submitted by Pratt & Whitney, North Haven, Connecticut. The facility is attempting to clean-close two surface impoundments and two waste piles located adjacent to each other. The units stored F006 electroplating sludges from the treatment of metal finishing wastewaters. The surface impoundments have not received waste since 1978; however, they stored F006 sludges until the sludge was removed in 1982. A portion of the northern impoundment was used to store a small quantity of sludge in March, 1985, while the wastewater treatment plant was being repaired. The waste piles stored dewatered sludge filter cake between 1978 and May, 1982, when the sludge was removed and disposed of off-site. The impoundments have become filled with water and are proposed to be maintained as landscape ponds.

The 1980 Part A permit application lists several units not included in the facility's 1986 revised Part A permit application. In both Part A applications, there are units not addressed in the closure plan. Also, the 1986 revised Part A application does not provide an adequate explanation for the unit changes made in Section III of the application (Processes-Codes and Design Capacities). Pratt & Whitney has been instructed to clarify the status of these additional units, with respect to partial or final facility closure.

0069X-AM

Note also that the 1986 Part A application shows an "Abandoned Metal Hydroxide Disposal Area - 7,000 CY Buried" at the southeastern portion of Pratt & Whitney's site. Based on my conversation with Arthur Wing, we have established that this unit is not RCRA-regulated since it was "closed" in the 1970s. It is a solid waste management unit (SWMU), however, and should be considered during the RCRA Facility Assessment.

The majority of the closure plan deficiencies fall under the following categories:

- o Soil Sampling and Analysis

  Pratt & Whitney has attempted to demonstrate clean closure of all four of the units by performing analyses of Extraction Procedure liquids from samples of soils from the impoundment and pile areas. The liquids are proposed to be analyzed for a number of metals, plus cyanide, pH, fluoride, and oil and grease. The soil samples from the background and waste pile areas are proposed to be analyzed individually, while surface impoundment samples are proposed to be composited. An unidentified method will be used to compare background and unit sample constituent concentrations.

  This soil sampling and analysis plan will not result in a demonstration that the clean closure requirements of 40 CFR 265.228(b) and 265.258(a), for the surface impoundments and waste piles, respectively, have been met. This is true for the following reasons:

  1. Use of the Extraction Procedure for soils contaminated with listed F006 waste is inappropriate. Soils should be analyzed for total metals by the acid digestion procedure of Method 3050 in EPA SW-846, Test Methods for Evaluating Solid Waste, 3rd Edition, 1986.

  2. Analysis of EP liquids for the nonmetal parameters is not analytically correct.

  3. Compositing of the impoundment soil samples is contrary to Region I guidance.

  4. The parameter list does not include the organic constituents detected in the ground water.

5. Since the location and extent of the waste piles has not been clearly defined, the proposed sampling locations for these units cannot be evaluated. In addition, Figure 3 of the closure plan, showing proposed sampling stations, was not provided by Pratt & Whitney.

The facility has been instructed in the specific comments to revise the soil sampling and analysis plan to address the above issues.

o Groundwater Monitoring

The proposed post-closure ground water sampling and analysis plan was reviewed for compliance with 40 CFR 265 Subpart F and for conformance with the RCRA Ground-Water Monitoring Technical Enforcement Guidance Document (TEGD). Several procedural deficiencies were noted concerning issues such as sampling equipment, field and laboratory Quality Control procedures, and statistical data comparison methods. Since the ground water assessment report was not reviewed, comments concerning well construction and placement could not be provided; recommendations concerning the wells were found in the Comprehensive Monitoring Evaluation (CME) report.

According to the CME Report and the facility's ground-water monitoring data, the ground water from all four of the monitoring wells contain elevated levels of several metals, volatile organics, chlorides, and total organic halogens. Several volatile organic compounds were observed in the upgradient and three downgradient wells. Therefore, it is suggested that Pratt & Whitney install additional background wells which monitor upgradient ground water unaffected by the facility, including any mounding effects. Also, the ground water assessment program should be evaluated to determine if it adequately characterizes the nature and extent of any ground water contamination at the site.

In order to demonstrate that the units can be clean-closed, Pratt & Whitney must either verify that the ground water contaminants are from a source other than the regulated units, or must provide a closure

plan that addresses removal of hazardous constituents in soils and ground water to background levels. If neither of these alternatives is achieved, then the closure plan must address the closure of the units as a landfill. Because there is evidence of ground water contamination, it is likely that in-place closure and post-closure care in compliance with 40 CFR 265.310 will be necessary. A post-closure permit also will be necessary.

o Cost Estimate and Certification

A cost estimate for closure was provided by Pratt & Whitney; however, the estimate must be modified based on this review. Furthermore, the cost estimate lacks detail and does not include the specific steps required to clean close any on-site units or provide for post-closure care. The cost estimate should also be revised to include the costs associated with hiring a third party to perform closure and post-closure care. Finally financial assurance and provisions for certification of closure and post-closure are not provided.

In this closure plan review we have addressed the closure policies and directives of Region I, as communicated by both Terrence Conlon and Arthur Wing and which are outlined in various guidance memos issued within the Region.

Please do not hesitate to call me or Mary Cervera, the Work Assignment Manager, if you have any questions regarding our incorporation of Region I policy in this review or any other concern related to the Pratt and Whitney closure activities.

Sincerely,

Andrew Teplitzky
Technical Director

cc: A. Wing, EPA Region I
T. Conlon, EPA Region I
K. Breeden
J. Grieve
M. Cervera
J. Bennett
G. Magnus
S. Smith, PRA
D. Stephenson, HLA-H

COMPLETENESS/TECHNICAL REVIEW OF INTERIM STATUS CLOSURE PLAN (Revision January 12, 1987)

PRATT & WHITNEY, INC.
NORTH HAVEN, CT

EPA I.D. NO. CTD001449784

Prepared for:

U.S. EPA Region I
John F. Kennedy Building
Boston, Massachusetts 02203

Prepared by:

A. T. Kearney, Inc.
699 Prince Street
P. O. Box 1405
Alexandria, VA 22313

In response to:

EPA Contract No. 68-01-7038
Work Assignment No. R01-01-19
May 11, 1987

COMPLETENESS/TECHNICAL REVIEW
INTERIM STATUS CLOSURE PLAN
PRATT & WHITNEY, INC.
NORTH HAVEN, CT
EPA I.D. NO. CTD001449784

General Comments

A technical review of the closure plan submitted by Pratt & Whitney, Inc. has been conducted. The closure plan submitted is substantially deficient, and omissions have been noted in the comments which follow. The primary document reviewed was the closure plan for the two surface impoundments and waste piles (Volumes I and II) dated January 12, 1987. Additional materials listed in the reference list (attached at the end of these review comments) were used to gain a background knowledge of the site.

The 1980 Part A permit application lists several units not included in the 1986 revised Part A permit application. In both Part A applications, there are units not addressed in the closure plan. Also, the 1986 revised Part A application does not provide an adequate explanation for the unit changes made in "Section III" of the application (Processes-Codes and Design Capacities). Comment I.B-1 asks for clarification of the status of these additional units.

The majority of the closure plan deficiencies fall under the following two categories:

- Soil Sampling and Analysis

  This soil sampling and analysis plan will not result in a demonstration that the clean closure requirements of 40 CFR 265.228(b) and 265.258(a), for the surface impoundments and waste piles, respectively, have been meet. This is true for reasons detailed in the specific comments which follow this section.

- Groundwater monitoring

  The post-closure ground water monitoring plan was reviewed for compliance with the requirements of 40 CFR 265 Subpart F and for conformance with the RCRA Ground-Water Monitoring Technical Enforcement Guidance Document (TEGD). Several procedural deficiencies were noted and are described in comment I.D-1a. According to the Draft Comprehensive Monitoring Evaluation Report (CME) and the ground-water monitoring data, the

groundwater from all four of the monitoring wells contains several elevated levels of metals, volatile organics, chlorides, and total organic halogens. Several volatile organic compounds were observed in the upgradient and three downgradient wells. Therefore, additional background well(s) should be installed which monitor upgradient groundwater unaffected by the facility, including mounding effects.

In order to demonstrate that the units (both surface impoundments and waste piles) can be clean-closed, Pratt & Whitney must either verify that the ground-water contaminants are from a source other than the regulated units, or must provide a closure plan that addresses removal of hazardous constituents (i.e., those constituents listed in 40 CFR 261, Appendix VIII) in soils and ground water to background levels. If neither of these alternatives is achieved, then the closure plan must address the closure of the units as a landfill. Because there is evidence of groundwater contamination, it is likely that in-place closure and post-closure care in compliance with 40 CFR 265.310 will be necessary. The specific comments which follow address both closure and post-closure requirements; if it can be adequately demonstrated that the units can be clean-closed, then the in-place closure comments and the post-closure comments do not need to be addressed.

COMPLETENESS/TECHNICAL REVIEW
INTERIM STATUS CLOSURE PLAN REVIEW
[40 CFR PART 265]

PRATT & WHITNEY, INC.
NORTH HAVEN, CT
EPA I.D. NO. CTD001449784

SPECIFIC COMMENTS

I. GENERAL CLOSURE REQUIREMENTS
[40 CFR 265 SUBPART G]

I.A. Closure Performance Standard: [40 CFR 265.111]

The closure plan must describe how the closure activities will minimize the need for post-closure maintenance and will control, minimize, or eliminate post-closure escape of hazardous waste, hazardous constituents (i.e., those constituents found in 40 CFR Part 261, Appendix VIII), leachate, contaminated run-off, or waste decomposition products to the ground or surface waters or to the atmosphere. The performance standard is currently (i.e., before September 15, 1987, when The Final Rule of March 19, 1987, regarding the new clean-closure policy takes effect) interpreted by USEPA to mean that wastes and waste residues in soil and ground water must be removed or treated to background quality.

The closure plan as proposed will not demonstrate that closure will meet the performance standard for the following cases:

- The soil sampling plan is inadequate to demonstrate clean closure, as discussed in comments I.B-4, II.B-2g, and III.B-2g;
- Groundwater monitoring data indicates that contamination has occurred from the units, and the plan does not include provisions for removal of contaminated groundwater; and
- The plan does not provide for in-place closure of the units as landfills, as is required if the units cannot be clean closed.

Therefore, revise the closure plan accordingly.

I.B. Content of Closure Plan: [40 CFR 265.112(a)]

I.B-1. Description of Partial and/or Final Closure: [40 CFR 265.112(a)]

The final facility closure plan should cover the maximum extent of the hazardous waste management unit operations. The plan should not be limited to the surface impoundments and waste piles, but should include other RCRA units that have been closed or will remain unclosed during the active life of the facility. The 1980 Part A application indicated the following RCRA units at the facility:

1. T01 a 2.5 MGD tank treatment unit
2. T04 a 1.5 ton per hour vacuum filter unit
3. S03 the 8,000 cubic yard sludge waste pile
4. S01 an 8,000 gallon capacity container storage area,
5. T01 a 58,000 gallon per day tank treatment unit
6. T01 a 200,000 gallon per day tank treatment unit
7. S04 the 10,500 cubic yard surface impoundments

The 1986 Part A includes:

1. S04 the surface impoundments being closed
2. S01 the container storage area
3. T01 two existing tank treatment units, which are existing solvent stills
4. T01 one new 200 gallon per day tank treatment unit, which is a new freon solvent reclamation still

No explanations were provided for removal of several of the units from the 1980 Part A. If any of these units were closed under 40 CFR Part

265, provide documentation that they were closed according to an approved closure plan. If one or more of these units are active RCRA units, describe how and when the facility will be partially closed and then finally closed.

I.B-2. Identification of Maximum Extent of Operations: [40 CFR 265.112(b)(2)]

To ensure that the final closure plan is comprehensive, the plan must specifically identify the maximum extent of the facility hazardous waste management unit operations which will remain unclosed during the active life of the facility. Describe the hazardous waste management units (see deficiency comment I.B-1) which will remain in operation after the closure of the two sludge impoundments and two waste piles, and identify the maximum extent of their operation. In addition, provide a scale drawing which depicts the exact dimensions and locations of all hazardous waste management units at the facility.

I.B.3 Removal and Management of Hazardous Wastes:

I.B-3a. Estimate of the Maximum Inventory of Hazardous Wastes: [40 CFR 265.112(b)(3)]

Revise the closure plan to include a complete description of the maximum inventory of wastes (volume and type) in storage and/or in treatment at any time during the active life of the facility. Specifically, this should include the volume of hazardous wastes managed at the container storage area and other RCRA units on site (see deficiency comment I.B.-1). Provide information, such as calculations, unit capacities, etc., to support the estimated volumes of hazardous wastes managed.

I.B-4. Description of Decontamination and Removal of Hazardous Waste Residues: [40 CFR 265.112(b)(4), 265.112(b)(5), 265.114, 265.228 and 265.258]

Provide a detailed description of the steps needed to remove or decontaminate all hazardous waste residues, contaminated containment system components, equipment, structures, and soils during closure. The description should include criteria for determining the extent of decontamination necessary to satisfy the closure performance standard, methods for sampling and testing surrounding soils, procedures for cleaning equipment and removing contaminated soils, and methods for properly disposing of contaminated waste residues and soils. Address deficiency comments II.B-2c through II.B-2g and III.B-2c through III.B-2g.

Implicit in the decontamination or removal of wastes, waste residues, and soils contaminated with hazardous waste or hazardous constituents is the removal and/or treatment of contaminated groundwater. The closure performance standard requires that groundwater, like soil, be removed/treated to background levels of any hazardous constituents listed in 40 CFR Part 261 Appendix VIII.

As noted in the general comment, the CME and groundwater monitoring data indicate the presence of contamination in samples taken from all four of the groundwater monitoring wells, including the supposed upgradient well. In order to demonstrate that the surface impoundments and waste piles can be clean-closed, Pratt & Whitney must verify that the groundwater contaminants are from a source other than the regulated units or must provide for removal of contaminated groundwater. This verification may require placement of additional wells (in order to gather background values unaffected by the facility operations) or reevaluation of the groundwater quality assessment program's ability to adequately characterize the nature and extent of the groundwater contamination. Revise the closure plan to address the groundwater contamination, either via further groundwater investigation, or collection and treatment of groundwater to background concentrations.

I.B-5. Detailed Description of Other Activities Necessary for Closure: [40 CFR 265.112(b)(5)]

Provide a detailed description of other activities necessary during partial and final closure to ensure that all partial closures and final closure satisfy the closure performance standards, including groundwater monitoring, leachate collection, and run-off and run-on control. The closure plan does not clearly demonstrate that leachate resulting from the hazardous waste management units at the site has been addressed.

I.B-6. Detailed Schedule for Closure: [40 CFR 265.112(b)(6) and 265.112(b)(7)]

The schedule for closure does not provide adequate details needed to track the progress of closure activities. For example, all sampling and analysis is to be conducted in 120 days; this lacks specificity. Provide a revised schedule to include:

1) A line item list of all closure activities (i.e., sampling, analysis, decontamination of equipment and structures, removal of soils, etc.) and detailed time allotments in the form of milestones to be completed for each activity.

2) Time required for intervening closure activities, which would allow tracking of the progress of closure; and

3) An estimate of the year of final closure for the facility (applicable to facilities using trust funds to demonstrate financial assurance, facilities whose operating life is less than 20 years, or facilities who are under interim status and do not have approved closure plans).

I.B-7. Amendment of Plan: [40 CFR 265.112(c)]

Amend the closure plan to address the deficiencies in this review.

I.B-10. Extensions for Closure Time: [40 CFR 265.113(b)]

Provide for the submittal of a petition for a closure time extension which justifies that a longer period of closure time is necessary, if the closure time period is to exceed the 180 days for completion of closure activities.

I.C. Certification of Closure and Survey Plat:

I.C-1. Certification of Closure: [40 CFR 265.115]

Revise the closure plan to state that within 60 days of completion of closure of the surface impoundments and waste piles certification will be submitted, both by the owner or operator and by an independent registered professional engineer, that the units have been closed in accordance with the approved closure plan. The certifications must be submitted by registered mail. In addition, the closure plan must state that documentation supporting the closure certification will be retained and furnished to the Regional Administrator upon request.

I.D. Post-Closure

I.D-1. Post-Closure Plan Requirements: [40 CFR 265.117 through 265.120, 265.228(c), 265.258(b), and 265.310]

The closure plan is based on the premise that all waste, waste residues, and contaminated materials or soils will be removed (i.e., clean closure). However, groundwater monitoring data indicates the presence of contamination in samples taken from all four of the groundwater monitoring wells, including the supposed upgradient well. Therefore, unless the soils and groundwater are decontaminated to background levels, or it is demonstrated that the contamination originated from a source other than the regulated units, clean closure is unattainable.

Since it appears that clean closure will not be immediately possible for the surface impoundments and waste piles due to subsurface contamination, provide a post-closure plan which complies with the post-closure care requirements in 40 CFR 265.117 through 265.120, 254.228(c), 265.258(b), and 265.310 (address deficiency comments D-1a through D-6). Post-closure care must continue for 30 years after the completion of closure, unless the Regional Administrator approves a shorter time.

I.D-1a. Post-Closure Monitoring: [40 CFR 265.117(a)(1)(i) and 265.118(c)(1)]

Describe the planned monitoring and reporting activities and the frequencies at which they will be performed to comply with Part 265 Subparts F, K, and L during the post-closure care period. Address deficiency comments II.C-2 and III.C-2.

I.D-1b. Post-Closure Maintenance: [40 CFR 265.117 (a)(1)(ii) and 265.118(c)(2)]

Describe the planned maintenance activities and frequencies at which they will be performed to ensure: (1) the integrity of the cap or other containment systems in accordance with the requirements of Part 265 Subparts K and L; and (2) the function of the monitoring equipment in accordance with the requirements of Part 265 Subparts F and L. Address deficiency comments II.C-3 and III.C-3.

I.D-2. Post-Closure Security: [40 CFR 265.117(b)(1) and 265.117(b)(2)]

Demonstrate that there will be adequate security at the closed site during the post-closure period if either: (1) wastes are to remain exposed after completion of closure; or (2) access to the closed site by the public or domestic livestock may pose a hazard to human health.

I.D-3. Post-Closure Contact: [40 CFR 265.118(c)(3)]

Provide the name, address, and telephone number of the person(s) or office to contact about the facility during the post-closure period.

I.D-4. Notice to Local Land Authority: [40 CFR 265.116 and 265.119(a)]

Include in the post-closure plan a statement which indicates that the owner/operator will

provide a copy of the survey plat, prepared and certified by a registered professional land surveyor, required to be filed with the local zoning authority, indicating the location and dimensions of disposal areas with respect to permanently surveyed benchmarks. The plat must contain a note clearly stating the owner/operator's obligation to restrict disturbance of the site as specified in Section 265.117(c). Coordinates must be provided for the surveyed benchmarks.

In addition to the survey plat, state that the owner/operator will provide a copy of the record indicating the type, location, and quantity of hazardous wastes disposed of within each area of the facility. Wastes disposed of before May 19, 1980 will be identified as accurately as possible based on the owner/operator's knowledge or other records kept at the facility. This record will also be submitted to the local land authority.

I.D-5. Notice in Deed: [40 CFR 265.119(b)(1)]

Include in the post-closure plan a statement indicating that the owner/operator will provide a copy of the notice or notation recorded in the deed to the facility property, or on some other instrument which is normally examined during title search, that will in perpetuity notify any potential purchaser of the property that: (1) the land has been used to manage hazardous wastes; and (2) its use is restricted under 40 CFR 265.117(c).

I.D-6. Certification of Completion of Post-Closure Care: [40 CFR 265.120]

Include in the post-closure plan a statement indicating that within 60 days after completion of post-closure care, the owner or operator will submit, by registered mail, a certificate that post-closure care has been completed in accordance with the approved post-closure plan. The certification must also be signed by an independent, registered, professional engineer.

I.E. Closure Cost Estimates: [40 CFR 265.142]

I.E-1. Cost Estimate When Closure is Most Expensive: [40 CFR 265.142(a)]

Revise the closure cost estimate to include costs for decontamination procedures, removal of equipment, and other closure plan revisions stated in these comments.

The closure cost estimate must be based on the costs of having a third party, neither a parent nor a subsidiary of the owner/operator, close the facility and must be supported by line item estimates with calculations or sub-totals based on unit prices, labor hours, equipment rental rates, disposal fees, and volume or quantity figures.

The closure cost estimate may not include:

1) Any salvage value that may be realized by the sale of hazardous wastes, facility structures, or equipment, land or other facility assets at the time of partial or final closure.

2) A zero cost of hazardous wastes that an owner or operator assumes a third party will take at no charge.

I.E-2. Adjustment For Inflation: [40 CFR 265.142(b)]

Revise the closure plan to reflect that the closure cost estimate will be adjusted annually (present estimate in 1986 dollars) to account for inflation, if necessary.

I.F. Financial Assurance for Closure: [40 CFR 265.143]

Provide a copy of the established financial assurance mechanism for facility closure. The mechanism must be one of the following:

- Closure trust fund: [40 CFR 265.143(a)]
- Surety bond guaranteeing payment into a closure trust fund: 40 CFR 265.143(b)]
- Closure letter of credit: [40 CFR 265.143(c)]

- Closure insurance: [40 CFR 265.143(d)]

- Financial test and corporate guarantee: [40 CFR 265.143(e)]

- Multiple financial mechanisms: [40 CFR 265.143(f)]

- Financial mechanism for multiple facilities: [40 CFR 265.143(g)]

I.G. Post-Closure Cost Estimates: [40 CFR 265.144]

I.G-1. Post-Closure Cost Estimate: [40 CFR 265.144(a)]

Along with the post-closure plan (see deficiency comment I.D-1), provide a post-closure cost estimate calculated to cover the cost, in current dollars, of post-closure monitoring and maintenance of the facility. The cost estimate must be adjusted annually to account for inflation in accordance with 40 CFR 265.144(b), and must be based on hiring a third party to conduct post-closure care activities.

I.H. Financial Assurance for Post-Closure: [40 CFR 265.145]

If applicable (see Deficiency Comment I.D-1), provide a copy of the established financial assurance mechanism for facility post-closure. The mechanism must be one of the following:

- Post-closure trust fund: [40 CFR 265.145(a)]

- Surety bond guaranteeing payment into a post-closure trust fund: [40 CFR 265.145(b)]

- Post-closure letter of credit: [40 CFR 265.145(c)]

- Post-closure insurance: [40 CFR 265.145(d)]

- Financial test and corporate guarantee: [40 CFR 265.145(e)]

- Multiple financial mechanisms: [40 CFR 265.145 (f)]

- Financial mechanism for multiple facilities: [40 CFR 265.145(g)]

I.I. Liability Coverage: [40 CFR 265.147]

I.I-1. Coverage for Sudden Accidental Occurrences: [40 CFR 265.147(a)]

Provide documentation of compliance with applicable liability requirements for sudden accidental occurrences. Liability coverage must be maintained for sudden accidental occurrences in the amount of at least $1 million per occurrence with an annual aggregate of at least $2 million. Liability coverage may be demonstrated in one of three ways: Endorsement or Certification [40 CFR 265.147(a)(1); Financial Test for Liability Coverage [40 CFR 265.147(a)(2); Use of Multiple Insurance Mechanisms [40 CFR 265.147(a)(3)].

I.I-2. Coverage for Non-Sudden Accidental Occurrences: [40 CFR 265.147(b)]

Provide documentation that liability coverage for non-sudden occurrences is in place in the amount of $3 million per occurrence and $6 million aggregate. Liability coverage may be demonstrated in one of three ways: Liability Insurance [40 CFR 265.147(b)(1)]; Financial Test for Liability Coverage [40 CFR 265.147(b)(2) and 265.147(f)]; and Multiple Insurance Mechanisms [40 CFR 265.147(b)(3)].

II. CLOSURE OF SURFACE IMPOUNDMENTS

II.B-1. Closure of Surface Impoundments: [40 CFR 265.112]

II.B-1a. Detailed Description of Steps Necessary to Close the Surface Impoundment: [40 CFR 265.112(b)]

The submitted closure plan is based on "clean closure" of the surface impoundments which requires that all waste residues, and contaminated materials or soils be removed. However, the proposed clean-up criteria are inappropriate, and there is documented groundwater contamination. Therefore, unless the area and groundwater are decontaminated to background levels, clean closure is unattainable.

Given the above, describe in exact detail how all waste residues, contaminated soils and groundwater, and structures and equipment will be removed and/or decontaminated at closure and managed as a hazardous waste. Modify the proposed clean-up criteria to indicate background levels for clean closure. Include the parameters and criteria to be used to verify decontamination to background levels. Revise the sampling and testing program to be used to verify decontamination of subsoils, groundwater, and equipment to address deficiency comments II.B-1b through II.B-2g.

In the event that clean closure is not attained, the surface impoundments will have to be closure as landfills in accordance with Section 265.310. In that case address deficiency comments II.B-3 through II.B-3j.

II.B-1b. Identification of Maximum Extent of Operation of the Surface Impoundment: [40 CFR 265.112(b)(2) and 265.228]

Provide a complete and detailed physical description of the surface impoundments which clearly identifies the maximum extent of operation of the units. Provide a scaled diagram which clearly indicates the dimensions and exact location of the units. See Deficiency Comment I.B-3a.

II.B-2. Closure of a Surface Impoundment Where the Wastes are Removed During Closure (Clean Closed): [40 CFR 265.228]

II.B-2a. Detailed Description of Removal of Waste Inventory: [40 CFR 265.112(b)(3), 265.114, and 265.228(a)]

Describe, in detail, how all contaminated materials and residues (i.e., soils) will be removed from the impoundments. Include the following:

1) Method of contaminated material removal, loading procedures, and location to which the material is to be removed;

2) Description of procedures to protect surface and groundwater during removal of impoundment contents; and

3 Description of methods to control wind dispersal of the material.

II.B-2c. Criteria for Determining the Extent of Decontamination Necessary: [40 CFR 265.112 (b)(4)]

The plan states that impoundment soil analytical results will be compared to background results to prove that contamination has been satisfactorily excavated. The plan does not state what actions will follow if contaminated materials are found to be present in and beneath the impoundments.

Describe the criteria that were used to determine how much sludge and soil were removed during impoundment cleaning in 1982 and 1985, i.e., visual observation, overexcavation, or sampling and analysis procedures and criteria. Describe how it will be determined how much, if any, additional soil will be removed if the proposed sampling and analytical results indicate that contaminated materials are still present in the impoundments. These removal criteria must provide for the removal of all contaminated materials (soils and groundwater) necessary to meet the closure performance standard (i.e., unit soils contain no greater than background levels of hazardous constituents).

II.B-2d. Detailed Description of Decontamination Steps: [40 CFR 265.112(b)(4), 265.114, and 265.228(a)]

Provide a detailed description of the steps used to remove or decontaminate all hazardous waste residues (include leachate and/or contaminated groundwater where applicable), contaminated containment system components and soils.

The closure plan reviewed indicated that the piping and equipment involved in the sludge disposal operations has been dismantled and decontaminated. Revise the closure plan to include a detailed description of the decontamination steps used to accomplish this task, and any other decontamination steps necessary for closure.

II.B-2e. Procedures for Cleaning Equipment and Structures: [40 CFR 265.112(b)(4), 265.114, and 265.228(a)

The submitted closure plan does not describe how all contaminated structures and equipment will be decontaminated or disposed at closure. Include all structures used during operation of the sludge drying beds (i.e., piping), all contractor equipment (trucks, excavator, shovels, etc.) and all sampling equipment.

For equipment to be decontaminated, provide: (1) method of decontamination; (2) procedures to protect the environment during decontamination (for example, how would wash water be collected); (3) method and location for disposal of decontamination residue; (14) testing procedures, sampling methods and frequencies, and criteria and parameters to be used to judge when decontamination is complete; and (5) procedures to be used if decontamination is incomplete (indicate the expected volume of materials to be removed).

For equipment that will be disposed, provide a list of the equipment, the disposal location, and the criteria to be used during closure to determine if any equipment originally listed for decontamination will be disposed of instead.

II.B-2g. Methods for Sampling and Testing to Demonstrate Success of Decontamination: [40 CFR 265.112(b)(4), 265.114, and 265.228(b)]

Provide additional criteria to be used to judge the success of the decontamination efforts. Include the detection of, or specific concentrations for, any hazardous waste or constituents known to be present or to have been present in the surface impoundments or groundwater (such as chromium and organic constituents). Describe the rationale for choosing these criteria.

Describe in detail the sampling procedures, test parameters, and analytical methods to be used in the testing program. Indicate how samples are judged to be representative and describe the rationale for the quantity of samples chosen. Provide for sampling and analysis of "clean" native soils to indicate background levels. Identify analytical methods for each parameter. A justification must be provided for any analytical methods specified other than those in EPA SW-846, Test Methods For Evaluating Solid and Hazardous Wastes, Third Edition, 1986.

Note that the EP toxicity extraction is not sufficient to determine the extent of contamination or to certify clean closure. Since contaminated soils and groundwater must be removed/treated to background levels, submit analytical methods for total metals analyses and 40 CFR 261, Appendix VIII constituents.

In addition to the above general comments, address the following specific items:

1. To establish soil background, detailed sampling and analysis procedures, techniques, rationales, and methods must be specified in the closure plan. At least three soil samples should be located in an area unaffected by facility activities to determine background.

2. Provide greater detail about the procedures proposed on page 10 of the closure plan to collect and compare results of the same stratum. Describe how it will be verified that soils to be compared are from the same stratum (i.e. visual appearance, grain size, etc.) and how the one foot lagoon samples were determined to be from the same soil stratum as upgradient samples taken at 35 feet (Note that Figure 3 referenced on pp. 9 and 10 of the closure plan is missing).

3. Compositing of samples from the waste management area to obtain values used to demonstrate compliance with 265.228(a) and (b) and 265.258 will likely mask the presence of individual samples having values above background, and therefore will not be acceptable to demonstrate clean closure.

4. The proposed parameter list does not include the organic constituents detected in the ground water. Revise the analytical parameters list to include the listed hazardous constituents found in 40 CFR Part 261 Appendix VIII constituents.

5. Analysis of soils for metals should be performed using a total metals [dry weight basis, (mg/kg)] test procedure in order to minimize the affect of naturally occurring metals in the soil on the analysis results. Use of the Extraction Procedure (EP) for soils contaminated with listed F006 waste is inappropriate. Soils should be analyzed for total metals by the acid digestion procedure of Method 3050 in EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition, 1986.

6. Analysis of EP liquids for the non-metal parameters is not analytically correct. Specify the analytical procedures from EPA SW-846 to be used for each of the selected parameters.

7. Provide a detailed description of the statistical procedures (e.g., Student's t-test at the 95% level of confidence or other method) which will be used to compare the sampling results to background concentrations. This information is needed to adequately demonstrate that all hazardous waste and residues have been removed. Stating in the closure plan that "an appropriate statistical procedure or direct comparison" will be used to prove decontamination is inadequate.

II.B-3. Closure of Disposal Surface Impoundments: [40 CFR 265.228(c) and 265.310]

If the surface impoundments are not demonstrated clean closed under 265.228, the units must be closed as a landfill. Closure plans for surface impoundments in which wastes or contaminated materials are to remain in place at closure must describe how the unit will closed, and must include a description of the final cover to be established and its expected performance. Revise the closure plan to address the following deficiency comments.

II.B-3a. Disposal Impoundments: [40 CFR 265.228(c)]

If wastes and/or waste residues are to remain in the impoundment after closure, describe the methods used to prepare the wastes for the final cover.

II.B-3b. Elimination of Liquids: [40 CFR 265.228(c)]

If free liquids are now present in the unit, describe how they will be removed or solidified at closure.

II.B-3c. Waste Stabilization: [40 CFR 265.228(c)]

Describe the methods to be used to stabilize remaining wastes to support the final cover, including: (1) stabilization methods, equipment, and materials; (2) required bearing strength of stabilized waste; (3) demonstration of stabilized waste bearing strength; and (4) methods for bearing strength determination during closure.

II.B-3d. Cover Design: [40 CFR 265.228(c)]

Thoroughly describe the cover design and installation procedures. This submission should include: (1) drawings showing cover layers, thicknesses, slopes, and overall dimensions; (2) the common name, species, and variety of the proposed cover crop; (3) descriptions of synthetic liners to be used, strength, thickness, and manufacturers' specifications; (4) descriptions of and specifications for protective materials placed above and below synthetic liners; (5) soil cap characteristics, including thickness and permeability; (6) soil cap construction plans including lift sequencing, and (7) average depth of frost penetration and the effects of freeze/thaw cycles.

II.B-3e. Minimization of Liquid Migration: [40 CFR 265.228(c) and 265.310(a)(1)]

For cover designs different than EPA-recommended designs [refer to Draft Guidance Document (1982), Landfill Design - Liner Systems and Final Cover; and SW-867, Evaluating Cover Systems for Solid and Hazardous Wastes, 1982)], provide engineering calculations showing the proposed cover will provide long-term minimization of liquid migration through the cover.

II.B-3f. Maintenance Needs: [40 CFR 265.228(c) and 265.310(a)(2)]

Discuss how the cover system will function effectively with minimum maintenance needs.

II.B-3g. Drainage and Erosion: [40 CFR 265.228(c) and 265.310(a)(3)]

Provide the following information: (1) calculations showing that the final slopes will not cause significant cover erosion during construction and throughout the post-closure periods; (2) description of drainage layer materials and their permeabilities; (3) engineering calculations demonstrating free drainage of precipitation off of and out of the cover; (4) estimation of the potential for drainage-layer clogging; and (5) descriptions, drawings, and calculations of the run-on and run-off control and diversion systems, including scales, piping, and ditches.

II.B-3h. Settlement, Subsidence, and Displacement: [40 CFR 265.228(c) and 265.310(a)(4)]

Describe potential cover settlement, subsidence, and displacement, considering immediate settlement, primary consolidation, secondary consolidation, and liquefaction. Include the following information: (1) potential foundation compression; (2) potential soil liner settlement; and (3) potential waste consolidation and compression resulting from waste dewatering, biological oxidation, and chemical conversion of solids to liquids. Describe the effects of potential subsidence and settlement on the ability of the final cover to minimize infiltration. Provide an analysis of the stability of slopes and dikes.

II.B-3i. Cover Permeability: [40 CFR 265.228(c) and 265.310(a)(s)]

Demonstrate that the cover system will have a permeability less than or equal to that of the liner system.

II.B-3j. Freeze/Thaw Effects: [40 CFR 265.228(c)]

Demonstrate that the cover system will be designed and constructed to resist damage from the effects of freeze/thaw cycles.

II.B-4. Detailed Schedule for Closure: [40 CFR 265.112(b)(6)]

(Address Deficiency Comment I.B-6)

II.C. Post-Closure Plan: [40 CFR 265.117 through 265.120, 265.228(c), and 265.310]

Revise the closure plan to address deficiency comments I.D-1 and II.C-1 through II.C-3.

II.C-1. Inspection Plan: [40 CFR 265.228(c)]

Describe the inspections to be conducted during the post-closure care period, their frequency, the inspection procedure, and the logs to be kept. The following items, as applicable, should be included in the inspection plan: (1) security control devices; (2) erosion damage; (3) cover settlement, subsidence, and displacement;

(4) vegetative cover condition; (5) integrity of run-on and run-off control measures; (5) cover drainage system functioning; (6) leachate collection/detection and removal system; (6) gas venting system; (7) well condition; and (8) benchmark integrity.

The rationale for determining the length of time between inspections should be provided.

II.C-2. Monitoring Plan: [40 CFR 265.228(c)]

The following comments refer to the September 12, 1986 Groundwater Monitoring Plan.

Specify the order in which samples will be collected from each well. Samples should be collected and containerized in the order of the volatilization sensitivity of the parameters, i.e., volatile organics samples should be collected and sealed first, before inorganics and metals. Background wells should be sampled first, then downgradient wells, for each sampling event. Describe procedures for in-situ or field determination of pH, temperature, and specific conductivity.

It is recommended that PVC bailers and tygon tubing not be used for sample collection; stainless steel or fluorcarbon materials have been determined to be more chemically inert than PVC and tygon.

Amend the sample bottle preparation procedure to clean the glass VOC bottles with acetone and pesticide-quality hexane instead of nitric and hydrochloric acids. Specify 1:1 nitric acid: water and 1:1 hydrochloric acid: water for glass containers for metals samples.

Specify that the samples to be analyzed for volatile organics, TOC, and TOX will be collected and handled such that no air space will be present in the sample bottle. Field logs and laboratory reports should note any headspace in the samples at the time of receipt in the laboratory, as well as at the time the sample was collected.

Describe any field filtering of samples to be conducted prior to analysis. A comparison of total and dissolved metals concentrations in a sample may be attributed to the original metallic content of soil particles and any sorption of ions to the particles.

Provide for the collection and analysis of sampling trip blanks and equipment blanks. This field QC procedure is intended to identify any interaction between the sample and the container, any contaminated rinsewater, any handling of the sample that alters analysis results, or any ineffective cleaning of a nondedicated sampling device.

Correct the text on page 8 of the Groundwater Monitoring Plan (September 12, 1986) to clarify the Chain of Custody procedures for sample handling. The procedures should include descriptions of:

- Sample labels which prevent misidentification of samples;
- Sample seals to preserve the integrity of the sample from the time it is collected until it is opened in the laboratory;
- Field logbook to record information about each sample collected during the groundwater monitoring program;
- Chain-of-custody record to establish the documentation necessary to trace sample possession from the time of collection to analysis;
- Sample analysis request sheets which serve as official communication to the laboratory of the particular analysis(es) required for each sample and provide further evidence that the chain of custody is complete; and
- Laboratory logbook and analysis notebooks which are maintained at the laboratory and record all pertinent information about the sample.

Specify analytical methods on page 7A for iron, manganese, chloride, sulfates, and sodium. Since these methods are not contained in EPA SW-846, it is suggested that appropriate procedures be used from either Standard Methods for the Examination of Water and Wastewater (NWWA/APHA) or from Methods for the Chemical Analysis of Water and Wastes (NTIS Number PB84-128677).

Provide a detailed description of procedures for the use of laboratory blanks, standards, duplicates, and spiked samples for calibration and identification of potential matrix interferences. Data from QC samples should be submitted to EPA with the groundwater monitoring sample results.

Justify the selection of the three t-tests, and discuss how one or all of them are appropriate for the site-specific hydrogeological conditions, the existing monitoring well network, and the historical interim status groundwater monitoring data.

Describe how the three t-test versions will be used to determine if statistically significant changes in the indicator parameters have occurred. That is, if one test shows "1" and the other are "0s" or vice versa, how will the result be interpreted? Describe how "less than" detection limit values, missing data, and outliers will be analyzed and interpreted within the three statistical methods.

II.C-3. Maintenance Plan: [40 CFR 265.228(c)]

Describe the preventative and corrective post-closure maintenance procedures, equipment requirements and material needs. Include the following items in the maintenance plan, as applicable: (1) repair of security control devices; (2) erosion damage repair; (3) correction of settlement, subsidence and displacement; (4) mowing, fertilization, and other vegetative cover maintenance; (5) repair of run-on and run-off control structures; (6) leachate collection/detection system maintenance; and (7) well replacement.

Describe the rationale to be used to determine the need for corrective maintenance activities.

II.D. Closure and Post-Closure Cost Estimates, Financial Assurance, and Liability Coverage: [40 CFR 265.142 through 265.147]

Address deficiency comments I.E through I.I-2.

III. CLOSURE OF WASTE PILES

III.B-1a. Detailed Description of Steps Necessary to Close the Waste Piles: [40 CFR 265.112(b)(1) and 265.258]

Deficiency Comment II.B-1a is also applicable for waste piles; therefore, provide the information requested in this comment.

III.B-1b. Identification of Maximum Extent of Operation of the Waste Piles: [40 CFR 265.112(b)(2) and 265.258]

The closure plan does not demonstrate the exact locations of the waste piles with respect to the surface impoundments, nor with respect to the road which is shown to bisect the two waste piles in Exhibit IX of the "North Haven Engineering Report Groundwater Monitoring Program" provided by the facility (Ref. 4; March 19, 1982).

Provide a scale drawing which depicts the exact dimensions and locations of the hazardous waste piles.

III.B-1c. Estimate of the Maximum Inventory of Hazardous Waste in the Waste Piles: [40 CFR 265.112(b)(3) and 265.258]

Provide an estimate of the maximum inventory of hazardous wastes (volume and type) to have been present in the waste piles at any time during the life of the facility. Include residues in the estimate. Provide supporting calculations for estimated amounts. The maximum inventory of the waste piles must be the total amount of hazardous wastes and residues that could be placed within the waste piles containment area during their operation.

III.B-2. Closure of Waste Pile Where Wastes are Removed (Clean Closed): [40 CFR 265.112 and 265.258]

III.B-2a. Detailed Description of Removal of Waste Inventory: [40 CFR 265.112(b)(3) and 265.258(a)]

Deficiency Comment II.B-2a is also applicable for waste piles; therefore, provide the information requested in this comment.

III.B-2b. Identification of Type of Off-Site Hazardous Waste Management Unit: [40 CFR 265.112(b)(3)]

Include in the closure plan the EPA I.D. number of the off-site hazardous waste disposal facility.

III.B-2c. Criteria for Determining the Extent of Decontamination Necessary: [40 CFR 265.112 and 265.258(a)]

Describe the criteria that were used in 1982 to remove sludge from the filter cake stock pile, i.e., visual observation, overexcavation, or sampling and analysis results and criteria.

Describe how the results of the proposed sampling and analysis program will be used to determine how much, if any, additional excavation may be needed at the waste piles.

Note that contaminated soils (including groundwater) must be removed until the material contains no greater than background levels of hazardous constituents (i.e., those constituents in Appendix VIII of 40 CFR 261).

III.B-2d. Detailed Description of Decontamination Steps: [40 CFR 265.112(b)(4) and 265.258(a)]

Revise the closure plan to include a detailed description of the steps performed or needed (proposed plan) to remove or decontaminate all hazardous waste residues, contaminated containment system components, and soils.

III.B-2e. Procedures for Cleaning Equipment and Structures and Removing Contaminated Soils: [40 CFR 265.112, 265.114, and 265.258(a)]

Deficiency Comment II.B-2e concerning decontamination of equipment and structures also applies for waste piles. Address the information requested in comment II.B-2e.

In addition, describe how contaminated soils will be removed from the surrounding area. Provide a detailed description of the steps including, but not limited to, procedures for removing contaminated soils, criteria and methods for sampling and testing to determine that contaminated soils have been removed, and methods and locations of final disposal.

III.B-2f. Detailed Description of Removal of Waste Residue: [40 CFR 265.112(b)(4), 265.114, and 265.258(a)]

Describe, in detail, how all contaminated materials and residues (i.e., soils) will be removed from the waste piles. Include the following:

1) Method of contaminated material removal, loading procedures, and location to which the material is to be removed.

2) Description of methods to protect surface and groundwater during removal of waste pile contents;

3) Description of methods to control wind dispersal (if appropriate).

III.B-2g. Methods for Sampling and Testing to Demonstration Success of Decontamination: [40 CFR 265.112(b)(4), and 265.114]

Respond to the deficiencies noted in comment II.B-2g with the following additional comment.

The location and number of soil samples taken from the waste piles is insufficient to demonstrate clean closure. According to the location of the waste piles in the Groundwater Monitoring Report (Ref. 4), soil samples were not taken at the location of the waste pile located between the road and the surface impoundments (see Figure 4 from the Part A application and Exhibit IX from the Groundwater Monitoring Report). Revise the sampling plan accordingly.

III.B-3. Closure of Disposal Waste Piles (Wastes in Place): [40 CFR 265.112(b)(5), 265.258(b), 265.310]

If the waste piles are not demonstrated clean closed under 265.258, the units must be closed as landfill in accordance with 40 CFR 265.310. Revise, the closure plan to incorporate the details of the final cover system as outlined in comments II.B-3d through II.B-3j.

III.B-4. Detailed Schedule for Closure of Waste Pile: (40 CFR 265.112(b)(6)]

(Address Deficiency Comment I.B-5.)

III.C. Post-Closure Plan: [40 CFR 265.117 through 265.120 and 265.258(b)]

Revise the closure plan to address deficiency comments I.D-1 and III.C-1 through III.C-3.

III.C-1. Inspection Plan: [40 CFR 265.258(b)]

Describe the inspections to be conducted during the post-closure care period, their frequency, the inspection procedure, and the logs to be kept. The following items, as applicable, should be included in the inspection plan: (1) security control devices; (2) erosion damage; (3) cover settlement, subsidence, and displacement: (4) vegetative cover condition; (5) integrity of run-on and run-off control measures; (5) cover drainage system functioning; (6) leachate collection/detection and removal system; (6) gas venting system; (7) well condition; and (8) benchmark integrity.

The rationale for determining the length of time between inspections should be provided.

III.C-2. Monitoring Plan: [40 CFR 265.258(b)]

Describe the monitoring to be conducted during the post-closure care period, including, as applicable, the procedures for conducting the following operations and evaluating the data gathered: (1) groundwater monitoring; and (2) leachate collection/detection and removal. Address deficiency comment II.C-2.

III.C-3. Maintenance Plan: [40 CFR 265.258(b)]

Describe the preventative and corrective maintenance procedures, equipment requirements and material needs. Include the following items in the maintenance plan, as applicable: (1) repair of security control devices; (2) erosion damage repair; (3) correction of settlement, subsidence and displacement; (4) mowing, fertilization and other vegetative cover maintenance; (5) repair of run-on and run-off control structures; (6) leachate collection/detection system maintenance; and (7) well replacement.

Describe the rationale to be used to determine the need for corrective maintenance activities.

III.D. Closure Cost Estimate, Financial Assurance, and Liability Coverage: [40 CFR 265.142 through 265.147]

Address deficiency comments I.E through I.I-2.

References

1. Closure Plan for the Surface Impoundments and Waste Piles at Industrial Waste Treatment Facility, Pratt & Whitney, North Haven, Connecticut (Volumes I and II) January 12, 1987. Note; Volume II consists of the three Appendices listed below:

   Appendix A - Closure Plan for Existing Surface Impoundments and Waste Piles at Industrial Waste Treatment Facility, Pratt & Whitney, North Haven, CT., by Loureiro Engineering Associates, February 1985.

   Appendix B - RCRA Part A Application, Pratt & Whitney, North Haven, CT., November 18, 1980 (revised October 21, 1986).

   Appendix C - Groundwater Monitoring Plan, Pratt & Whitney, North Haven, CT., (revised September 12, 1986).

2. Draft Comprehensive Monitoring Evaluation (CME), Pratt & Whitney, North Haven, Connecticut, March 1987.

3. Letter from Merril S. Hohman (Region I, USEPA) to Mr. C.R. Shea (Plant Manager, Pratt & Whitney) dated 10-09-86 discussing closure of surface impoundments and related schedule.

4. North Haven Engineering Report, Groundwater Monitoring Program for Pratt & Whitney Aircraft Group Manufacturing Division, North Haven, CT, by Industrial Pollution Control, Inc., March 1, 1981 revised March 19, 1982.

Unit Name or Location: Surface Impoundments and Waste Piles
Facility Name: PRATT & WHITNEY, NEW HAVEN
ID No. CTD 001449511

INTERIM STATUS CLOSURE/POST-CLOSURE PLANS

		Provided (Y/N) or NA)	Adequate (Y/N)	Reference	Comments
I.	GENERAL CLOSURE REQUIREMENTS				
A.	Closure performance [40 CFR 265.111]	Y	N	1	See comment I.A
B.	Content of closure plan				
B-1.	Description of partial and/or final closure [40 CFR 265.112(a)]	Y	N	1 (pp. 8-12)	See comment I.B-1
B-2.	Identification of maximum extent of operations [40 CFR 265.112(b)(2)]	Y	N	1 (pp. 3-5 and Figure 1)	See comment I.B-2
B-3.	Removal and management of hazardous waste				
B-3a.	Estimate of maximum inventory of hazardous waste [40 CFR 265.112(b)(3)]	Y	N	1 (p. 5)	See comment I.B-3a
B-3b.	Detailed description of removal of waste inventory [40 CFR 265.112(b)(3)]	Y	Y	1 (pp. 5, 8, 9, 10)	
B-3c.	Identification of and type of off-site hazardous waste management unit(s) [40 CFR 265.112(b)(3)]	Y	Y	1 (pp. 5, 8)	

Facility Name: PRATT & WHITNEY, NEW HAVEN
ID No. CTD 001449511

		Provided (Y/N) or NA)	Adequate (Y/N)	Reference	Comments
I.	GENERAL CLOSURE REQUIREMENTS (cont'd)				
B-4.	Description of decontamination and removal of hazardous waste and residues [40 CFR 265.112(b)(4-5) and 265.114]	Y	N	1 (pp. 8-12)	See comment I.B-4
B-5	Detailed description of other activities necessary for closure [40 CFR 265.112(B)(5)]	N			See comment I.B-5
B-6.	Detailed schedule for closure [40 CFR 265.112(b)(6-7)	Y	N	1 (p. 15)	See comment I.B-6
B-7.	Amendment of closure plan [40 CFR 265.112(c)]	N			See comment I.B-7
B-8.	Schedule for beginning closure [40 CFR 265.112(d)]	Y	Y	1 (pp. 1-2)	
B-9.	Wastes treated, removed or disposed of within 90 days and extensions of time periods [40 CFR 265.113(a)]	Y	Y	1 (pp. 1-2)	
B-10.	Closure completed within 180 days and extensions of time periods [40 CFR 265.113(b)]	Y	N	1 (p. 15)	See comment I.B-10
C.	Certification of closure and Survey Plat				
C-1.	Certification of Closure [40 CFR 265.115]	Y	N	1 (p. 15)	See comment I.C-1
C-2.	Survey Plat [40 CFR 265.116]	N			See comment I.D-4

Facility Name: PRATT & WHITNEY, NEW HAVEN
ID No. CTD 001449511

		Provided (Y/N) or NA)	Adequate (Y/N)	Reference	Comments
I.	GENERAL CLOSURE REQUIREMENTS (cont'd)				
D.	Post-closure				
D-1.	Post-closure plan requirements [40 CFR 265.117 through 265.120, 265.228(c), and 265.258(b)]	N			See comment I.D
D-1a.	Post-closure monitoring [40 CFR 265.117(a)(1)(i) and 265.118(c)(1)]	N			See comment I.D-1a
D-1b.	Post-closure maintenance [40 CFR 265.117 (a)(1)(ii), 265.118(c)(2)]	N			See comment I.D-1b
D-2.	Post-closure security [CFR 265.117(b)(1) and 265.117(b)(2)]	N			See comment I.D-2
D-3.	Post-closure contact [40 CFR 265.118(c)(3)]	N			See comment I.D-3
D-4.	Notice to local land authority [40 CFR 265.116 and 265.119(a)]	N			See comment I.D-4
D-5.	Notice in deed [40 CFR 265.115(b)(1)]	N			See comment I.D-5
D-6.	Certification of Completion of post-closure care [40 CFR 265.120]	N			See comment I.D-6
E.	Closure cost estimate [40 CFR 265.142]				
E-1.	Cost estimate: when closure is most expensive [40 CFR 265.142(a)]	Y	N	1 (p. 16, 17)	See comment I.E-1

Facility Name: PRATT & WHITNEY, NEW HAVEN
ID No. CTD 001449511

		Provided (Y/N) or NA)	Adequate (Y/N)	Reference	Comments
I.	GENERAL CLOSURE REQUIREMENTS (cont'd)				
E-2.	Adjustments for inflation [40 CFR 265.142(b)]	N			See comment E-2
F.	Financial assurance for closure [40 CFR 265.143]	N			See comment I.F
G.	Post-closure cost estimates [40 CFR 265.144]				
G-1.	Post-closure cost estimates [40 CFR 265.144(a)]	N			See comment I.G-1
G-2.	Adjustments for inflation [40 CFR 265.144(b)]	N			See comment I.G-1
H.	Financial assurance for post-closure [40 CFR 265.145]	N			See comment I.H
I.	Liability coverage [40 CFR 265.147]				
I-1.	Coverage for sudden accidental occurrences [40 CFR 265.147(a)]	N			See comment I.I-1
I.I-2.	Closure for non-sudden accidental occurrences [40 CFR 265.147(b)]	N			See comment I.I-2

Unit Name or Location: Surface Impoundments
Facility Name: PRATT & WHITNEY, NEW HAVEN
ID No. CTD 001449511

		Provided (Y/N) or NA)	Adequate (Y/N)	Reference	Comments
II.	CLOSURE OF SURFACE IMPOUNDMENT				
A.	Closure performance standards for surface impoundment [40 CFR 265.111]	(Address this item under Section I A.)			
B.	Content of Closure Plan [40 CFR 265.112 and 265.228]	Y	N	1 (pp. 1-17)	See comments II.B-1 through II.B-3j
B-1.	Closure of all surface impoundments [40 CFR 265.112]				
B-1a.	Detailed description of how the surface impoundment will be closed [40 CFR 265.112(b)(1) and 265.228]	Y	N	1 (pp. 8-12)	See comment II.B-1a
B-1b.	Identification of maximum extent of operation of surface impoundment [40 CFR 265.112(b)(2) and 265.228]	Y	N	1 (p. 5)	See comment II.B-1b
B-1c.	Estimate of maximum inventory of waste in the surface impoundment [40 CFR 265.112(b)(3) and 265.228]	Y	Y	1 (p. 5)	
B-2.	Closure of surface impoundment where wastes are removed during closure (clean closed) [40 CFR 265.228]				

Facility Name: PRATT & WHITNEY, NEW HAVEN
ID No. CTD 001449511

		Provided (Y/N) or NA)	Adequate (Y/N)	Reference	Comments
II.	CLOSURE OF SURFACE IMPOUNDMENT (cont'd)				
B-2a.	Detailed description of removal of waste inventory [40 CFR 265.112(b)(3), 265.114 and 265.228(a)]	Y	Y	1 (pp. 5, 8)	
B-2b.	Identification of and type off-site hazardous waste management unit(s) [40 CFR 265.112(b)(3)]	Y	Y	1 (pp. 5, 8)	
B-2c.	Criteria for determining the extent of decontamination necessary [40 CFR 265.112(b)(4)]	Y	N	1 (p. 8)	See comment II.B-2c
B-2d.	Detailed description of decontamination steps [40 CFR 265.112(b)(4), 265.114, and 265.228(a)]	N			See comment II.B-2d
B-2e.	Procedures for cleaning equipment and structures [40 CFR 265.112(b)(4), 265.114 and 265.228(a)].	Y	N	1 (p. 8)	See comment II.B-2a
B-2f.	Detailed description of removal of waste residues [40 CFR 265.112(b)(4) and 265.114]	N			See comment II.B-2a

Facility Name: PRATT & WHITNEY, NEW HAVEN
ID No. CTD 001449511

		Provided (Y/N) or NA)	Adequate (Y/N)	Reference	Comments
II.	CLOSURE OF SURFACE IMPOUNDMENT (cont'd)				
B-2g.	Methods for sampling and testing to demonstrate success of decontamination [40 CFR 265.112(b)(4), 265.114, and 265.228(b)]	Y	N	1 (pp. 9-12)	See comment II.B-2g
B-3.	Closure of surface impoundment as a disposal unit (wastes in place) [40 CFR 265.228(c)]	N			See comment II.B-3
B-3a.	Disposal Impoundments [40 CFR 265.228(c)]	N			See comment II.B-3a
B-3b.	Elimination of Liquids [40 CFR 265.228(c)]	N			See comment II.B-3b
B-3c.	Waste Stabilization [40 CFR 265.228(c)]	N			See comment II.B-3c
B-3d.	Cover design [40 CFR 265.228(c)]	N			See comment II.B-3d
B-3e.	Minimization of liquid migration [40 CFR 265.228(c)]	N			See comment II.B-3e
B-3f.	Maintenance Needs [40 CFR 265.228(c)]	N			See comment II.B-3f
B-3g.	Drainage and erosion [40 CFR 265.228(c)]	N			See comment II.B-3g
B-3h.	Settlement, subsidence, and displacement [40 CFR 265.228(c)]	N			See comment II.B-3h

Facility Name: PRATT & WHITNEY, NEW HAVEN
ID No. CTD 001449784

		Provided (Y/N) or NA)	Adequate (Y/N)	Reference	Comments
II.	CLOSURE OF SURFACE IMPOUNDMENT (cont'd)				
B-3i.	Cover permeability [40 CFR 265.228(c)]	N			See comment II.B-3i
B-3j.	Freeze/thaw effects [40 CFR 265.228(c)]	N			See comment II.B-3j
B-4.	Detailed schedule for closure of surface impoundment [40 CFR 265.112(a)(4)	Address this item under Section I. B			
C.	Post-closure plan [40 CFR 265.117 through 265.120, 265.228(c) and 265.310]	Address this item under Sections I. D			
C-1.	Inspection plan [40 CFR 265.228(c)]	N			See comment II.C-1
C-2.	Monitoring plan [40 CFR 265.228(c)]	N			See comment II.C-2
C-3.	Maintenance plan [40 CFR 265.258(c)]	N			See comment II.C-3
D.	Closure cost estimate, financial assurance and liability coverage [40 CFR 265.142, 265.143, and 265.147	Address these items under Sections I. E, I. F, and I. G			

Unit Name or Location: Waste Piles
Facility Name: PRATT & WHITNEY, NEW HAVEN
ID No. CTD 001449784

		Provided (Y/N) or NA)	Adequate (Y/N)	Reference	Comments
III.	CLOSURE OF WASTE PILES				
A.	Closure performance standards for waste piles [40 CFR 265.111]	(Address this item under Section I-A)			
B.	Content of Closure Plan				
B-1.	Closure of all waste piles [40 CFR 265.112(b) and 265.258]				
B-1a.	Detailed description of how waste piles will be closed [40 CFR 265.112(b)(1) and 265.258]	N			See comment III.B-1a
B-1b.	Identification of maximum extent of operation of waste piles [40 CFR 265.112(b)(3) and 265.258]	N			See comment III.B-1b
B-1c.	Estimate of maximum inventory of hazardous waste in the waste piles [40 CFR 265.112(b)(3) and 265.258(a)]	N			See comment III.B-1b
B-2.	Closure of waste pile where wastes are removed (clean closed) [40 CFR 265.112(b)(3) and 265.258(a)]				
B-2a.	Detailed description of removal of waste inventory [40 CFR 265.112(b)(3) and 265.258(a)]	N			See comment III.B-2a

		Provided (Y/N) or NA)	Adequate (Y/N)	Reference	Comments
III.	CLOSURE OF WASTE PILES (cont'd)				
B-2b.	Identification of and type of off-site hazardous waste management unit(s) [40 CFR 265.112(b)(3) and 265.258(a)]	Y	Y	1 (pp. 5, 8)	
B-2c.	Criteria for determining the extent of decontamination necessary [40 CFR 265.112(b)(4), 265.114, and 265.258(a)]	Y	N	1 (pp. 8-12)	See comment III.B-2c
B-2d.	Detailed Description of Decontamination Steps: [40 CFR 265.112(b)(4) and 265.258(a)]	N			See comment III.B-2d
B-2e.	Procedures for cleaning equipment and structures and removing contaminated soils [40 CFR 265.112(b)(4), 265.114, and 265.258(a)]	N			See comment III.B-2e
B-2f.	Detailed description of removal of waste residues [40 CFR 265.112(b)(4), 265.114, and 265.258(a)]	N			See comment III.B-2f
B-2g.	Methods for sampling and testing to demonstrate success of decontamination [40 CFR 265.112(b)(4), 265.114, 265.258(a)]	Y	N	1 (pp. 8-22)	See comment III.B-2g

Facility Name: PRATT & WHITNEY, NEW HAVEN
ID No. CTD 001449511

		Provided (Y/N) or NA)	Adequate (Y/N)	Reference	Comments
III.	CLOSURE OF WASTE PILES (cont'd)				
B-3	Closure of waste piles as a disposal unit (wastes in place) [40 CFR 265.112(b)(5) and 265.258(b)]	N			See comment III.B-3
B-4.	Detailed schedule for closure of the waste pile [40 CFR 265.112(b)(6)]	Address this item under Section I- B-5			
C.	Post-Closure Plan [40 CFR 265.117 through 265.120, 265.258(b), and 265.310(b)]	Address this item under Section I-D and VII C			
C-1.	Inspection Plan [40 CFR 265.258(b)]	N			See comment III.C-1
C-2.	Monitoring Plan [40 CFR 265.258(b)]	N			See comment III.C-2
C-3.	Maintenance Plan [40 CFR 265.258(b)]	N			See comment III.C-3
D.	Closure Cost Estimate, Financial Assurance and Liability Coverage [40 CFR 265.142, 265.143, and 265.147	Address these items under Sections I-E, I-F, I-G, I-H, and I-I.			